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Remarks / Arguments

In the Office Action, the Examiner rejected claims 1 – 12 as being unpatentable over Sharma et al. (U.S. Patent No 5,511,190). By this paper, the Applicant presents arguments to place claims 1 – 12 in a position of allowance. Claims: 1 - 12 are now pending. In view of the following remarks, the Applicant respectfully requests reconsideration and allowance of all pending claims.

General Comments

In the Office Action, the Examiner's position indicates he may not fully understand the differences in the operations being claimed in the prior art and the current application, in particular the difference between grouping queries and distinct queries. In all database operations, the task is to query the database for information and return it to the user. In more complex operations such as those addressed in the prior art and the instant application, the task is to query the database for information, perform some level of processing or analysis and return to the user the final results of the processing or analysis. This is done by running complex operations that are made up of multiple simple operations run together as a batch with only the final results being returned to the user. The simple operations may return preliminary results for further processing, by subsequent operations before arriving at final results, which are returned to the user.

In the prior art, operations were performed in a blocking operation. That is one where the final results of the operation are not returned to the user until processing of all records is

PAGE 9/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

completed. This blocking type of operation was necessary because the prior art described a method of aggregating information across the group using a grouping table (e.g., totaling all 2006 expenses paid to employees by department). In this case, information could not be returned to the user for any of the groups until all records were processed. If information for a group was returned before the last records were processed, and the last records belonged to a group that was already returned, then the data prematurely returned would be wrong because it did not aggregate the information from the later records.

In the instant application, the operation performed is a non-blocking operation. That is one where the results of the operation can be returned to the user as the records are processed without holding the final results until all records are processed. By determining that the records to be returned are distinct entries of data rather than aggregates, the operation can be differentiated from that of the prior art and run in a non-blocking fashion. An example would be to list all employees in the sales department who submitted expense reports in 2006. In this case, all records do not need to be processed prior to return results, Each unique employee can be returned as it is found. The operation will still need to perform the grouping operations (i.e. calculate the grouping tables) to determine which data has been returned to the user, but unlike the blocking operation, where the grouping tables were part of the results to be retuned to the user, the grouping is for the process's internal tracking and can be discarded at the end of the operation.

PAGE 10/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

Response to Arguments

The examiner states applicant is inaccurate in stating that Sharma fails to teach "data being returned to the user substantially concurrently with the rest of the data being returned" and refers to column 11 lines 32 – 40 of the Sharma application as support for this. Applicant points out that he was mis-quoted by the examiner. The statement in the previous response was that Sharma fails to teach "data being returned to the user substantially concurrently with the rest of the data being **processed**." The citation by the examiner does indicate "the contents of the group table are reported to the user via the communications interface" *Sharma*, Col. 11, Lines 39 – 41. However, it also states this reporting to the user only to occur "If the end of the table has been reached." *Sharma*, Col 11, Lines 38 - 39. The rest of the examiner's citation states what should be done "[i]f the end of the table T1 has not been reached", (i.e. processing of all records has not been completed.) *Sharma*, Col 11, Lines 35 – 36. In this instance the instructions are to "[begin] processing the next row of the input table" (i.e. continue processing.) Sharma, Col 11, Line 38.

Though the Examiner references Col. 6, Lines 20 -24 to support that database table T1 is made available to the user SQL queries, the examiner fails to note that table T1 "provides the raw data initially processed by the grouping function," *Sharma*, Col 6, Lines 22 – 23, and that this raw data "provide[s] the member data to be grouped or aggregated." *Sharma*, Col 6, Lines 30 – 31. This is the **raw data**, which is available to the user prior to processing. The Examiner may be confusing table T1 with the Overflow Table T2, which "provides temporary storage for database records (raw or partially processed) that have been read from T1 but not immediately grouped." *Sharma*, Col 6, Lines 36 – 38. But it should be noted that T2 still only holds data

PAGE 11/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

which is raw, or partially processed, and not final results. Further, applicant refers to Col 6, Lines 32 – 34 of *Sharma*, which states "The overflow table T2 ... serves as a database of sorts, but is not made available for user SQL queries."

As further evidence that the prior art does not report results "substantially concurrently with the rest of the data being processed," the applicant refers examiner to the paragraph at the top of column 12 (lines 1 – 9) which state "[o]nce the last row [] is read, ... for each entry in the group table GT, [the aggregate information is computed]. The groupings are **then reported** to the communications interface where they are made accessible for display on the user workstation." Applicant argues that this statement illustrates that all data is read before results are retuned to the user, and that this must be the case in the prior art because all data necessary to computer the aggregate information is not available until after the last row is read.

For the reasons stated above, the applicant request the examiner reconsiders the arguments made with respect to claims 1-12 made in the prior response as repeated below, and withdraw the rejections to said claims.

Claim Rejections under 35 U.S.C. § 102(b)

In the Office Action, the Examiner rejected claims 1 – 12 under 35 U.S.C. § 102(b) as being anticipated by Sharma et al.

Claim 12

With respect to claim 12, applicant respectfully submits Sharma fails to teach "*a non-blocking grouping mechanism*". Further, Sharma fails to teach "data being returned to the user

PAGE 12/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

substantially concurrently with the rest of the data being processed". This is evidenced by the phrase "The end of file flag EOF is a Boolean that indicates when set that the **last record from the table T1 has been read, at which point the group function reports to the communications interface** all group data aggregated in the group table GT ...[emphasis added]" (Col. 8, L. 36 – 40). As one skilled in the art is aware, a mechanism which fails to return output until all input has been received is known as a blocking mechanism.

Applicant also notes Sharma fails to teach "a select mechanism by which a prescribed number of output groups are requested by the user, wherein operations of all of the non-blocking grouping mechanism, the overflow mechanism, and the return mechanism are halted when the requested prescribed number of output groups is reached." As evidenced by previous citing of Sharma's teaching of a blocking mechanism.

Claim 1

With respect to claim 1, applicant respectfully submits Sharma fails to teach "a non-blocking grouping mechanism" and also fails to teach "*returns ... entries of data substantially concurrently with processing following grouping of data.*" This is again evidenced by Sharma's teaching of a blocking mechanism. Applicant has also previously amended claim 1 to include the limitation of returning "distinct entries" since as applicant discussed in the application "*[With Hash] grouping devices that provide **aggregate grouping**, no useful data is provided to (or accessible by) the user until all of the input rows of data is analyzed and returned. [emphasis added]*" (Application, Para. 0002)

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FEB 20 2007

Claims 5 and 8

With respect to claims 5 and 8, applicant submits Sharma fails to teach "*returning distinct entries of data from the input entries of data to the user substantially concurrently with the receiving input entries of data.*" As evidenced by previous arguments, this is a major difference between blocking and non-blocking operations.

Claim 9

With respect to claim 9, applicant submits Sharma fails to teach "*returning the data in a non-blocking fashion and in the case of overflow, ensuring that the user eventually receives the correct remaining rows.*" As Sharma was using a blocking mechanism to process data, there was no need to track rows returned to ensure duplicates which were overflowed were not returned as is the case of the current application. Therefore Sharma failed to teach this point as it was not an issue for Sharma's blocking implementation.

Claim 2

With respect to claim 2, applicant submits Sharma fails to teach a "*non-blocking grouping mechanism*" as evidenced in previous arguments.

Claim 6

With respect to claim 6, applicant submits while Sharma does teach "*accommodate[ing] memory overflow by selected portions ... being flushed to a secondary memory,*" Sharma fails to teach all limitation of the base claim 5 as argued above.

PAGE 14/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

Claim 3

With respect to claim 3, applicant refers to previous arguments regarding claim 1 on which claim 3 depends.

Claim 7

With respect to claim 7, applicant refers to previous arguments regarding claim 5 on which claim 7 depends.

Claim 4

Examiner states "*With respect to claim 5, Sharma discloses wherein the primary memory being primary Random Access Memory (RAM) [Col. 5, Lines 9-15; Fig. 1].*" Applicant assumes an error was made and examiner meant to refer to claim 4. To which, applicant refers to previous arguments regarding claim 1 on which claim 4 depends.

Claims 9 – 11

Applicant refers examiner to previous arguments regarding Sharma's failure to teach "*non-blocking*".

PAGE 15/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10

Conclusion

The Applicant respectfully submits that all pending claims are in condition for allowance. However, if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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PAGE 16/16 * RCVD AT 2/20/2007 4:50:14 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-2/22 * DNIS:2738300 * CSID:2815148332 * DURATION (mm-ss):04-10